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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,097	08/18/2003	Warran B. Lineton	71024-023	3347

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EXAMINER

DANIELS, MATTHEW J

ART UNIT	PAPER NUMBER
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1732

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/643,097	LINETON, WARRAN B.	
	Examiner	Art Unit	
	Matthew J. Daniels	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 February 2007 and 16 April 2007 have been entered. In this response, Claims 1, 3, 4, and 8 were amended. Claims 2 and 9 were cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Rejections set forth previously are withdrawn in view of the Windeler reference which teaches details of PTFE extrusion sintering.

3. **Claims 1, 3, 4, 7, and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Windeler (USPN 3483597) in view of Thorsud (USPN 4968726) and Adams (USPN 4375441).

As to Claim 1, Windeler teaches a method of fabricating PTFE material comprising:

preparing PTFE resin powder (1:23-25, 1:40);

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feeding the powder into a compaction zone to at least partially compact and shape the powder (Fig. 1, item A, 2:10-17); and

providing a flow of the powder from the compaction zone downstream to a separate heating zone (Fig. 1, item B) and heating and sintering the powder within the heating zone (2:28), and drawing a vacuum on the powder to extract air from the powder (2:68-70).

Windeler does not explicitly teach (a) a continuous process, (b) drawing a vacuum within the heating zone while sintering the mixture, and (c) providing a mixture and heating the mixture within the heating zone by exciting a susceptor material by application of wave energy.

However, these aspects of the invention would have been *prima facie* obvious for the following reasons:

a) The process of Windeler is continuous during application of the ram to the powdered material, which would move the rest of the material through the extruder. In the alternative, even if the process of Windeler were interpreted to be a batch process, it is generally considered to be *prima facie* obvious to make a batch process continuous. *In re Dilnot*, 319 F.2d 188, 138 USPQ 248 (CCPA 1963) (Claim directed to a method of producing a cementitious structure wherein a stable air foam is introduced into a slurry of cementitious material differed from the prior art only in requiring the addition of the foam to be continuous. The court held the claimed continuous operation would have been obvious in light of the batch process of the prior art.). Here the introduction of material into the extruder is sufficiently similar to the foam material of *Dilnot*, and it is submitted that no unexpected result is found by making the process of Windeler continuous.

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b) Windeler teaches drawing a vacuum through vents (35a). Although it is noted that the vent holes are located prior to the heating section, it is submitted that the device of Windeler meets the limitation because the drawing of vacuum would not be limited to the region immediately surrounding the vent holes. Because the vacuum would be drawn over substantially the whole portion of the extruder where open porosity persists, it is submitted that the vacuum would also be drawn "within" the heating zone while sintering the mixture.

c) Thorsud teaches a method for providing dielectric heating to a polymeric material by mixing the polymeric material with a sensitizer (Col. 5, for example) and subsequently heating using dielectric wave energy and molding (5:29).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Thorsud into that of Windeler for the following reasons:

(a) Windeler suggests that "suitable means" are provided for heating in the heating zones and Thorsud provides a method and means suitable for heating a polymer during extrusion (5:1-30, especially 5:4)

(b) Windeler suggests that the heating and evacuation of air from the polymer of the polymer are limiting steps (1:40-47), and Thorsud provides a method that would efficiently (5:6) and rapidly heat the material, thereby increasing the throughput in the extruder.

(c) Adams would motivate one to make the combination of Thorsud with Windeler because of the desirable aspects of dielectric heating in a molding process, namely that heating and fusion occurs throughout the entire volume substantially simultaneously (8:33-38), the heat can be turned on and off instantaneously allowing for improved monitoring and control of the process

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(8:38-42), the method is efficient and does not throw off excessive wasted heat (8:40-45), and the equipment for dielectric heating is easy to operate, long-lived, and requires little maintenance (8:45-48).

As to Claim 3, Windeler provides a zone where finishing compaction of the mixture would occur prior to sintering (area bridging zones A and B). It is submitted that the heat from the heating elements of either Windeler or Thorsud would provide a preheating action within the compacted region. **As to Claim 4**, Windeler provides a cooling zone at the end of the extruder. **As to Claim 7**, although Thorsud discloses "RF" or "radio frequency", it is submitted that the wavelengths disclosed by Thorsud encompass frequencies implicitly falling within the microwave portion of the electromagnetic spectrum, for example, 2450 MHz. Therefore, the broadest reasonable interpretation of "microwave energy" encompasses the frequencies disclosed by Thorsud. Also see 9:44. Note that microwave ovens conventionally operate at 2450 MHz.

As to Claim 8, Windeler teaches a method of fabricating PTFE material comprising:
preparing PTFE resin powder (1:23-25, 1:40);
compacting the powder (Fig. 1, item A, 2:10-17); and
drawing vacuum on the powder (2:68-70); and
sintering the powder (Fig. 1)

Windeler does not explicitly teach (a) drawing a vacuum on the mixture during the sintering step, and (b) heating the mixture by exciting a susceptor material by application of microwave energy.

However, these aspects of the invention would have been prima facie obvious for the following reasons:

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a) Windeler teaches drawing a vacuum through vents (35a). Although it is noted that the vent holes are located prior to the heating section, it is submitted that the device of Windeler meets the limitation because the drawing of vacuum would not be limited to the region immediately surrounding the vent holes. Because the vacuum would be drawn over substantially the whole portion of the extruder where open porosity persists, it is submitted that the vacuum would also be drawn "within" the heating zone while sintering the mixture.

c) Thorsud teaches a method for providing dielectric heating to a polymeric material by mixing the polymeric material with a sensitizer (Col. 5, for example) and subsequently heating using dielectric wave energy and molding (5:29). Although Thorsud discloses "RF" or "radio frequency", it is submitted that the wavelengths disclosed by Thorsud encompass frequencies implicitly falling within the microwave portion of the electromagnetic spectrum, for example, 2450 MHz. Therefore, the broadest reasonable interpretation of "microwave energy" encompasses the frequencies disclosed by Thorsud. Also see 9:44. Note that microwave ovens conventionally operate at 2450 MHz.

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Thorsud into that of Windeler for the following reasons:

(a) Windeler suggests that "suitable means" are provided for heating in the heating zones and Thorsud provides a method and means suitable for heating a polymer during extrusion (5:1-30, especially 5:4)

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(b) Windeler suggests that the heating and evacuation of air from the polymer of the polymer are limiting steps (1:40-47), and Thorsud provides a method that would efficiently (5:6) and rapidly heat the material, thereby increasing the throughput in the extruder.

(c) Adams would motivate one to make the combination of Thorsud with Windeler because of the desirable aspects of dielectric heating in a molding process, namely that heating and fusion occurs throughout the entire volume substantially simultaneously (8:33-38), the heat can be turned on and off instantaneously allowing for improved monitoring and control of the process (8:38-42), the method is efficient and does not throw off excessive wasted heat (8:40-45), and the equipment for dielectric heating is easy to operate, long-lived, and requires little maintenance (8:45-48).

4. **Claims 5 and 6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Windeler (USPN 3483597) in view of Thorsud (USPN 4968726), Adams (USPN 4375441), and further in view of Kalis (USPN 5609624). Windeler, Thorsud, and Adams teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claims 5 and 6**, Windeler teaches zone D as a cooling zone (Fig. 1), but Windeler is silent to a tubular structure and to a process where the extruded article is cut while still warm. However, the subject matter of Claim 6 was previously stated to be well known (page 3 of the 17 January 2007 Final Rejection), and does not appear to be disputed. Additionally, Kalis teaches extruding PTFE material in the form of a tubular extrudate which is cut upon issuing from the extrusion die (4:46-52). In the combination where the method of cutting of the article upon issuing from the extruder of Kalis is performed with the method of Windeler, it is submitted that the cutting would be performed while the article was

still warm, but below the sintering temperature. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kalis into that of Windeler (a) because it is desirable to provide tubular structures by extrusion to be used as vascular grafts or for transporting liquids, and (b) it is desirable to produce articles having finite lengths.

Response to Arguments

5. Applicant's arguments filed 16 April 2007 have been fully considered but they are not persuasive or are moot in view of the new ground of rejection set forth above. The arguments appear to be on the following grounds:

- a) The Examiner concludes that the PE and PTFE materials set forth in the Encyclopedia reference are equivalent alternative materials. However, rather than showing their equivalency, the Encyclopedia teaches is that both are non-responsive to dielectric heating. PTFE absorbs twice the power absorbed by PE, and therefore there is no equivalency.
- b) The Dolan reference teaches processing articles in a vacuum compression mold. There is no teaching of drawing a vacuum during a sintering process.
- c) Adams states (4:14) that the material should have a sufficiently high loss factor to be effectively heated with dielectric heat. The preferred compositions have loss factors above 0.08. This is far outside the reach of Applicant's teaching in Claim 1. Due to its loss index, PTFE is the most highly improbably material listed to be dielectrically heated. PE and PTFE are not equivalent alternative materials because the loss index of PTFE is half that of PE with respect to its capacity for radio frequency heating.

6. These arguments are not persuasive for the following reasons:

a,c) It is submitted that the Encyclopedia reference shows PE and PTFE materials to be substantially the same in their non-responsiveness to dielectric heating. One of ordinary skill considering the Encyclopedia reference would have found it obvious to use the same method, disclosed within the same reference, to increase the dielectric heating capacity of both materials.

While Adams states that the material should have a sufficiently high loss factor to be effectively heated, it is submitted that doing so does not teach away from the method of Thorsud or the Encyclopedia, which both teach (substantially the same) methods for increasing the loss factor of the material such that it could be effectively heated with dielectric energy. Adam's suggestion that the material should have a particular loss factor in order to be heated with dielectric energy appears instead to suggest Thorsud's method, which would increase the loss factor, in order to provide the ability to dielectrically heat a polymeric material.

In the rejection above, Windeler teaches conventional aspects of PTFE extrusion and Thorsud teaches that it is known to incorporate susceptor material and dielectric heating into an extrusion process. Adams motivates one to make the combination in order to provide the desirable aspects of dielectric heating described in column 8 of that reference.

b) This argument is moot in view of the new rejection above. Windeler draws vacuum on the barrel of a heated extruder in a process that appears to be conventional.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Matthew J. Daniels', is positioned above the printed name.

Matthew J. Daniels

A.U. 1732
18 July 2007